

OBESITY

AND THE ENVIRONMENT

Initiatives of the National Institute of Environmental Health Sciences

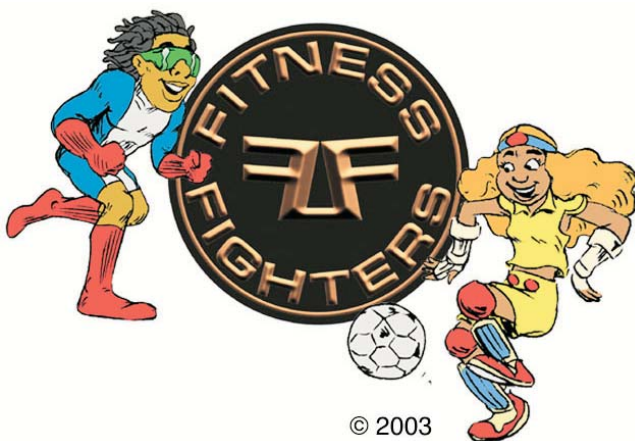
There is an obesity epidemic in this country and there are no indications that it is abating. The National Health and Nutrition Survey data from 1999 - 2000 show that about 65% of the adult population in the United States is overweight (defined as having a body mass index, BMI, greater than 25 kg/m²) and that 31% are obese (BMI > 30 kg/m²). If the weight gain continues at the present rate, the obesity rate will approach 40% within the next five years. This problem is not confined to the United States. The World Health Organization (WHO) has declared excess weight as one of the top ten health risks in the world and one of the top five in developed nations.

Obesity increases the rate of disease, disability, and health care expenditures, while decreasing productivity and quality of life. For example, obesity is linked to the dramatic increase in type-2 diabetes and in psychosocial disorders now being seen among children. Other morbidities associated with obesity include: asthma, cancer, cardiovascular disease, osteoarthritis, and kidney disease. Obesity-associated health care costs account for approximately 7% of national expenditures.

While obesity is an enormous public health threat for Americans of all ages, it is a far more serious problem for children and minorities. The Centers for Disease Control and Prevention (CDC) recently estimated that 15% of all children in the U.S. are overweight, and nearly 25% of black and Hispanic children weigh too much. If the current trends continue, CDC has estimated that one-third of all children, and about one-half of black and Hispanic children, born in 2000 will develop diabetes. If these estimates are correct, about 50 million Americans could have diabetes by 2050. The implications, in terms of disease burden, quality of life, and health care costs, are frightening. As this generation of children reaches adulthood, there will be a dramatic increase in physical complications associated with diabetes (e.g., amputations, blindness, kidney failure, heart attacks).

Obesity, like most chronic health problems, is caused by complex interactions between genetic, environmental and behavioral factors. Basic research is needed to untangle these interactions and develop molecular intervention strategies. Simultaneously, a more practical solution is to modify the environmental contributors responsible for the majority of the obesity epidemic. The major

environmental contributors are eating behavior (excess calories), sedentary lifestyle, and the built environment (e.g., sidewalks and transportation systems). The NIEHS is developing research and education programs, in partnership with other federal agencies (e.g., Department of Housing and Urban Development and Department of Transportation), to implement and evaluate intervention strategies and economic incentives to promote lifestyle changes that reverse the trend in weight gain. The task is not impossible, because even small changes can show improvement, as Hill et al. (Science, 299:853, 2003) demonstrated by their estimates that the trend in weight



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gain could be halted by walking one extra mile per day and decreasing food consumption by 5%. Moving forward on this issue, though, is critical because despite considerable media attention about the rising prevalence of overweight and obesity, most Americans still do not view this problem as a major public health concern.

NIEHS is taking a three-prong research approach to develop effective models to reverse the trend toward increased obesity by identifying successful strategies to: (1) change eating behavior, (2) promote a more active lifestyle, and (3) change the design of residential communities to make them more conducive to walking. A number of potential strategies are being considered. One of the more innovative ideas is to develop a children's television program, comparable to "Sesame Street" called "The Fitness Fighters." NIEHS is working with an Emmy Award-winning writer of Sesame Street and other children's television shows to develop the series. Efforts also are underway to get the food industry to co-fund this effort.

